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07/894,931	06/08/92	EVERETT M	6209.150

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1112	5

DATE MAILED: 12/30/92

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined ☑ Responsive to communication filed on 6/8/92 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☑ Notice re Patent Drawing, PTO-948.
3. ☑ Notice of Art Cited by Applicant, PTO-1449
4. ☐ Notice of Informal Patent Application, Form PTO-152
5. ☐ Information on How to Effect Drawing Changes, PTO-1474
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☑ Claims 1-27 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims 1-27 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☑ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.

8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. These drawings are ☐ acceptable; ☐ not acceptable (see explanation).

10. ☐ The ☐ proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections MUST be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.

12. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 1 - 12 and 14 - 27 are rejected under 35 U.S.C. § 103 as being unpatentable over Schaefer et al. (U.S. 4,299,860) in view of Cooper, Jr. et al.

Schaefer et al. disclose a method for applying abrasive particles to a substrate by melting a portion of the substrate with a laser and injecting an abrasive powder into the molten pool formed by the laser as the substrate moves relative to the laser (col. 3, line 42 - col. 4, line 1; Fig. 1). The materials

inherently have the claimed melting point relationships. The reference differs from the claims in that it does not disclose that the abrasive particles are coated with a thermal insulating layer for preventing melting of the abrasive particles by the molten metal and does not teach that the substrate can be a superalloy. However, Cooper, Jr. et al. teach that coating abrasive particles, such as metal oxide particles, with a thermal insulating layer, such as titanium, in multiple layers if desired, and at a thickness of less than 150 microns, prevents deterioration of the abrasive particles due to exposure to the laser in a process such as that of Schaefer et al. for coating a metal, including turbine blades for which superalloys are well known materials of construction, with abrasive particles (col. 1, lines 16 - 19 and 34 - 40; col. 2, lines 11 - 22 and 32 - 50; col. 3, lines 17 - 20 and 51 - 61). Given this teaching, it would have been obvious to one of ordinary skill in the art to coat the abrasive particles in the Schaefer process to prevent them from being degraded by the heat. In view of the above teachings, formation of particular combinations of coating and abrasive particle combinations and abrasive particle thickness and particle injection at a particular rate would have been obvious selections for one of ordinary skill in the art through no more than routine experimentation.

Claim 13 is rejected under 35 U.S.C. § 103 as being unpatentable over Schaefer et al. (U.S. 4,299,860) in view of Cooper, Jr. et al. as applied to claim 1, further in view of Matarese et al. (U.S. 4,744,725).

Schaefer et al. do not disclose machining the resolidified pool. However, Matarese et al. teach that machining an abrasive particle layer which has been applied to a metal substrate exposes the abrasive particles and improves the abrasive quality of the product (col. 3, lines 61 - 66). In view of this teaching, it would have been obvious to one of ordinary skill in the art to machine the resolidified pool in the Schaefer et al. process to better expose the abrasive particles.

Claims 1 - 27 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is improper because "relatively small" in line 3 and "interaction area" in line 5 are vague and indefinite, and because it is not clear in line 6 whether the source or energy is localized.

Claim 2 is improper because it is not clear whether how the step relates to claim 1. It is suggested that the claim read: -- The method of claim 1, wherein said thermal insulating layer has a melting point in excess of the melting point of the

encapsulated abrasive particles.--. Similar comments apply to claims 3 - 7, 9, 10, 14, and 23 - 26; e.g., it is suggested that claim 25 read --The method of claim 17, wherein said dispersing step is carried out by injecting the matrix blend into the pool at a rate of from about 0.27 to about 0.30 grams per second.--.

Claim 8 is improper because it is not clear whether the metals recited are the same as the thermal insulating layer and whether the oxides are the same as the abrasive particles.

Claim 11 is improper because the antecedent basis for "insulating layer of the powder system" is not clear. It is suggested that the term read --thermal insulating layer--.

Claim 12 is improper because "adapted for preventing crack formation" is vague and indefinite and it is not clear whether "a matrix powder" is the same as that recited in claim 1.

Claim 15 is improper because "low" and "high" are vague and indefinite.

Claim 16 is improper because the relation to claim 1 is not clear. It is suggested that the claim read --The method of claim 1, wherein a plurality of coatings form the thermal insulating layer.--.

Claim 17 is improper because in lines 7 and 8 it is not clear whether the metal is the same as the thermal insulating layer. It is suggested that the lines read --coating on the particulates being an encapsulating thermal insulating layer

formed from a metal;--. Also, in line 12, "within" should read --into--.

Claim 20 is improper because in line 5, "and" needs to be deleted.

Claims 13, 18, 19, 21, 22, and 27 are rejected as being dependent from claims rejected under 35 U.S.C. § 112 second paragraph.

The specification is objected to because at each appearance of the trademarks, they should be identified as such by a means such as spelling them using all capital letters (MPEP 608.01(v)). Also, if "38 Alundum" on page 18, line 21 is a trademark, it needs to be designated as such.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title does not describe what is being claimed.

Additional references listed on Form PTO-892 further show the state of the art.

This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

The drawings are objected to because of the reasons given on Form PTO-948. Correction is required.

Any inquiry concerning this communication should be directed to Terry J. Owens at telephone number (703) 308-0661.

Terry J. Owens

TERRY OWENS
EXAMINER
GROUP 1100

tjo
December 27, 1992